CLEAN COAL TECHNOLOGY

THE INVESTMENT PAYS OFF

A REPORT BY THE ASSISTANT SECRETARY
FOR FOSSIL ENERGY

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The Investment Pays Off

This document summarizes some of the achievements to date resulting from one of the most successful government/industry partnerships ever implemented—the Clean Coal Technology Demonstration Program (CCT Program).

Presented here is solid evidence that the taxpayers' investment has paid real and measurable dividends. Technological innovation introduced through the CCT Program now provides consumers cost-effective, clean, coal-based energy. Further, the pioneer power systems introduced have laid the foundation for a new generation of power systems responsive to worldwide concern about global climate change.

In the coming years, our nation must make the best use of all domestic energy resources, including coal. Our reliance upon coal for the foreseeable future necessitates development and deployment of the cleanest, most efficient technologies possible.

Clean coal technologies can produce reliable, low-cost energy. With them, the United States can achieve continued economic growth and enhanced technological leadership in the global marketplace. This can improve the quality of our lives, as well as the lives of our global neighbors, while keeping our commitment to a cleaner, healthier environment.

The number and magnitude of demonstration projects put in place by the CCT Program is unprecedented, as is the extent of industry cost-sharing. More than $5.6 billion is being expended, with industry and states investing two dollars for every one from the federal government. The investment has resulted in 40 projects in 18 states. Over half the projects have already reached successful completion.

The technological successes are evident. SO_2 and NO_x control technologies emerging from the CCT Program have moved into the utility and industrial marketplace and now provide cost-effective regulatory compliance. A new generation of advanced coal-based power systems has been placed in commercial service that represents a quantum leap forward in terms of efficiency and environmental performance. These advanced power systems projects will provide a springboard for widespread, global deployment. This in turn will contribute greatly to reductions in greenhouse gas emissions.

The CCT Program has brought together the best resources available from industry, universities, and state and federal governments ensuring that clean coal technologies can turn today's vision into tomorrow's reality. The drawing board designs of the 1980s are today becoming the concrete and steel of a new generation of clean, efficient coal-based systems.

The Clean Coal Investment

The CCT Program represents the nation's single largest successful investment in environmental technology.

Five competitive solicitations sponsored by the U.S. Department of Energy resulted in selection of the most advanced coal-based technology concepts available anywhere in the world. Federal funding was leveraged twofold through partnerships encompassing utilities, state governments, technology developers, and research organizations.

Creating a Cleaner Environment

In 1986, the U.S. and Canadian Special Envoys on Acid Rain recommended a multi-billion dollar effort to address acid rain. The President responded the same year with the present day CCT Program, which built on a program begun by Congress a year earlier. The initiative created a government-industry partnership to expand the "menu of control options" for acid rain. The CCT Program has met the acid rain challenge. A wide range of control options emerging from the Program aided response to the first phase of Clean Air Act Amendments of 1990 (CAAA) reductions in acid rain precursors, which went into effect in 1995. A portfolio of cost-effective control options is also in place to meet the more stringent second phase of CAAA provisions in 2000. Moreover, technologies developed will serve as a foundation for meeting the increasingly stringent air quality requirements evolving to meet urban "soot and smog" concerns in the post-2000 era.

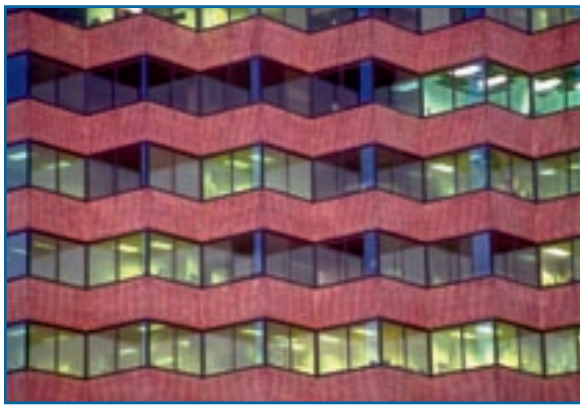
Global climate change became a major issue over the course of the CCT Program, prompting action to reduce carbon dioxide (CO_2), a greenhouse gas that is a product of combustion. In response, the CCT Program placed increased emphasis on development of a new generation of coal-based power systems characterized by high efficiency, as well as very low pollutant emissions. Today, first-of-a-kind demonstration units are fulfilling that objective by operating in commercial service and producing follow-on commercial sales.

Fueling an Expanding Economy

Economic growth requires affordable energy. To keep energy costs low, coal must remain a major percentage of the U.S. energy mix as demand for electric generating capacity increases. The Energy Information Administration (EIA) forecasts that 363 gigawatts of new generating capacity (more than 1,200 plants) will be needed by 2020 to meet growing demand and to offset retirements.

In 1997, coal supplied over 53 percent of the nation's electricity. Despite increased contributions from natural gas and renewables, EIA projects that coal will be the mainstay of electricity generation through 2020, and will continue to account for about half the total capacity. To ensure that coal-based systems meet these expectations, the CCT Program is providing the environmentally acceptable systems needed.

Creating Productive Jobs



A healthy environment means a better future for generations of Americans to come. Beyond a cleaner environment, the CCT Program has created jobs for Americans: designing, constructing, and operating advanced systems that clean the air and provide new sources of energy. Thousands of jobs alone resulted from implementing the program. Many more will be created downstream as the technologies are commercialized both in domestic and international markets.

A typical retrofit pollution control project, for example, employs 100-200 construction workers, while an advanced power generation project can require thousands. As many as 50-130 permanent jobs can result from a single new plant. Indirect benefits accrue as well, such as maintaining vital coal-producing and equipment-manufacturing industries.

Making the United States More Competitive

The world market for clean energy technologies is expanding at an unprecedented rate. Global demand for power generating technologies and services is anticipated to create a $480 billion export market over the next three decades and support more than 600,000 jobs in the U.S. power-equipment industry. Electrification in developing nations, modernization of outdated energy facilities in newly emerging democracies, and economic expansion in much of the Pacific Rim are creating enormous opportunities for U.S. companies to export equipment and coal-based fuel products that enhance efficiency and environmental performance.

The CCT Program positions the United States to capture a growing share of these markets. In no other country can prospective customers see the range of actual working systems that is being demonstrated in the United States. Other U.S. Department of Energy activities are aimed at creating a favorable export climate for U.S. coal and coal technology.

Creating a New Government-Industry Partnership

The CCT Program was created as a joint government-industry initiative. It is a partnership in which the federal government sets performance objectives, founded in national environmental concerns, and asks industry to respond with technical solutions. After the U.S. Department of Energy selects the projects most suited to accomplish solicitation objectives and establishes performance measures, industry takes the lead in project management and assumes responsibility for commercialization. In this cooperative effort, industry retains its rights to the real and intellectual property generated through the development and commercialization of the technology in return for assuming at least 50 percent of the project costs.